

PATENT SPECIFICATION

NO DRAWINGS

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COMPLETE SPECIFICATION

Surface Improving or Finishing

We, GUSTAV ADOLF BARTH and KURT LOHMANN, both of German nationality, personally responsible partners of LOHMANN KOMMANDIT GESELLSCHAFT, of Fahr/Rhein, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to the finishing or improvement of surfaces.

There have heretofore been proposed various processes for improving or finishing surfaces, in accordance with which a carrier or backing material of wood or metal has been provided with a surface layer. Where wood imitations are involved, decorative finishes have also been used, in addition to the known veneers. Such decorative finishes manifest the wood structure as imprints on backings of paper or cardboard and can also be produced photographically in imitation of wood graining. In all these cases the carrier or backing material for the patterning or graining determines the external appearance to such an extent that a natural appearance, for example wood structure, is not obtained.

30 The same disadvantage must be put up with if the material to be improved or finished is laminated with laminated or imprinted foils. The fault is not eliminated by applying the foil material closely to the surface to be improved by the use of pressure sensitive adhesives.

35 The imitation of wood structure as an improvement or finish on surfaces has therefore heretofore been accomplished by treating the surface to be improved or finished with lacquers or fillers and mechanically roughening the latter in order then to varnish the so-treated surface true to colour. It has been

found, in such procedure, that the mechanically-produced porosity is most effectively concealed by the surface varnish, so that even in this case a natural wood structure can not be achieved as a surface finish or improvement.

The same disadvantages apply in the imitation of any other natural surfaces.

50 The present invention is a process for surface finishing or improving by means of coverings applied to a carrier or backing material, comprising bonding to the surface to be finished or improved, using pressure sensitive or thermoplastic adhesives, a previously consolidated fibrous fleece provided with decorative effects of the desired surface character while retaining the high surface porosity and fibre structure.

60 The fleece material web used may for instance consist of superimposed layers of fibrous fleece, which are for instance secured together by needling and thereupon printed. In addition to the mechanical consolidation, a fleece material web impregnated with resins or lacquers can be used, the mechanical treatment or the impregnation providing that the porosity and fibre structure of the surface of the fleece material remains unimpaired, and also that the decorative effect is not affected or damaged.

75 The process is preferably conducted by using a multiply-lamiated fleece material which, if the fleece is made of cellulose-based fibres, has been consolidated in a bath of soda lye by softening of the fibre surfaces; this fleece is then stabilized by de-acidifying, washing and drying and may thereupon be decoratively coated. Further, it is possible to decide the surface appearance of the fleece material by dyeing the surface fibres without modifying the fibre structure and porosity.

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As used in this specification the expression "consolidated fibrous fleece" means a fibrous fleece which has been strengthened by joining together the fibres of the fleece, e.g. by needling or impregnation as described herein, without rendering the fleece non-porous.

The bond between the surface to be finished or improved and the fleece material itself is preferably effected by means of pressure sensitive adhesives which can be applied to the fleece material. Alternatively a thermoplastic adhesive may be interposed between the surface to be finished or improved and the covering material; the fleece material itself being then pressed onto the surface, where thermoplastic adhesives are used, with the use of elevated temperature.

Suitable fleece materials are fleece webs of fibrous material of suitable staple length, and the loose or crimped fleece after suitable lamination of the required number of layers may be consolidated by needling the layers together. Alternatively, impregnating media consisting of natural and synthetic resins or varnishes may be utilised, these being used in such quantities that the high porosity and fibre structure of the surface of the fleece material is retained. The pretreated fleece is smoothed in any known manner and printed by any known method, these operations being so conducted that neither the mechanical action nor the proportioning of the impregnating medium nor the effects of either, impairs the fibrous material structurally or affects the porosity of the fleece undesirably.

EXAMPLE 1:

A three-ply fibrous fleece of cellulose-base synthetic fibres of 30 g per square metre in weight with crossed fibre layers is consolidated by guiding the fleece through an alkaline bath of 5 to 15% NaOH at temperatures of between -5 and $+15^{\circ}\text{C}$ with a period of dwell of from half a minute to one minute, de-acidifying the fleece, washing and drying. The consolidated fleece has an entirely smooth but highly porous surface, and, with a staple length of 20 to 40 mm the soluted fibres at the surfaces are bonded together by squeezing without destroying the fibre structure. The fibrous fleece is so imprinted with an oak-grain pattern that the pressure neither fills up the surface pores nor destroys the fibre structure.

The fleece web so obtained is provided with a pressure sensitive adhesive consisting of synthetic rubber mixed with synthetic resins and dissolved in benzene, and is pressed in an appropriate manner on to the carrier or backing material to be improved or finished after evaporation of the solvent. The surface then displays a surprisingly natural oak-grain pattern.

EXAMPLE 2:

A five-ply fibrous fleece, initially strengthened by needling of 40 g/sq. metre weight and consisting of regenerated cellulose fibres mixed with natural fibres such as cotton is sprayed on the reverse side with a polythene solution and is thereupon so consolidated by rolling that the fibre structure of at least one surface is retained as is also the porosity thereof. The resulting fleece material is provided with a decorative coating, on the opposite surface without affecting the porosity and fibre structure. The fleece material is then laid on the surface to be improved or finished, a thermoplastic adhesive film being interposed between the two, and is pressed at a suitable temperature with the surface to be improved or finished, those portions of the adhesive film penetrating into the pore of the fleece material bringing about an additional bond between the fibres. The extent to which such penetration takes place is determined by the pressure and temperature applied.

A surprisingly natural appearance of the surface can be obtained by the surface-finishing or improving process according to the present invention. This is due to the exploitation of the natural pores of the fleece material in conjunction with the imprinted wood grain and the fibrous structure of the surface of the consolidated fleece. The latter is, moreover, perfectly smooth and additional effects of surprising beauty can be obtained, for example as known with natural wood veneers, by high gloss or dull polishing. In so doing, the disadvantages of wood veneers are thus far avoided that the finishing or improving process according to the present invention can be carried out with the use of material in rolls of any desired length and width. The surface finishing or improving material is free from cracks and stable as regards temperature influences. The fibre structure enables fitting to surfaces of any shape, while entirely avoiding splintering or fraying cut edges. A further advantage consists in that any irregularities in the backing material to be improved or finished are compensated during pressing, by the adhesive or by the fleece material.

Any appropriate materials can be used as the backing or carrier material. Surprisingly decorative effects can be obtained by colour emphasis of the fibre structure or of individual fibres. These are produced, for instance, by the use of fleece materials with metallized surfaces. Further, tarsia-work with surprising vivaceous effects can be obtained by using laminating material which has completely smooth cut edges, which produce contiguous vivaceous contrasts. Curved ornaments, three-dimensional shapes, spherical surfaces etc. may be given a surface finish or improvement with surprising effects by virtue of the pliability of the material.

Finally, continuous-flow production is possible, since the webs of finishing or improving material can be produced in any desired length. In addition to the natural imitation of wood-grain patterns, leather effects, pile or crepe fabric effects, and other effects, can be obtained, as the surface of the fleece material may have a corresponding preparation

WHAT WE CLAIM IS:—

- 10 1. A process for surface finishing or improving by means of coverings applied to a carrier or backing material, comprising bonding to the surface to be finished or improved, using pressure sensitive or thermoplastic
- 15 adhesives, a previously consolidated fibrous fleece provided with decorative effects of the desired surface character while retaining the high surface porosity and fibre structure.
- 20 2. A process in accordance with claim 1, in which a multi-ply fibrous fleece is mechanically consolidated, especially by needling, to form a single web of fleece material which is printed and used as the covering material.
- 25 3. A process in accordance with claim 1, comprising utilizing a fibrous fleece consolidated by impregnation with resins or varnishes while retaining the porosity and fibre structure of the fleece.
4. A process in accordance with claim 1,

comprising utilizing a fibrous fleece produced from cellulose-based fibres and consolidated by solution of the fibre surfaces in a soda-lye bath, de-acidifying, washing and drying, and subsequently provided with a decorative finish.

5. A process in accordance with any of claims 1 to 4, in which the surface of the fleece material employed as the covering is determined by the structure and colouring of the surface fibres.

6. A process in accordance with any of claims 1 to 5, in which the adherent surface of the fleece material web is provided with a pressure sensitive adhesive and the web is pressed on to the carrier or backing material.

7. A process in accordance with any of claims 1 to 5, in which the fleece material is applied to the backing or support material through an intermediate layer of a thermoplastic, synthetic material.

8. A process for surface finishing or improving substantially as hereinbefore described in Example 1 or Example 2.

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